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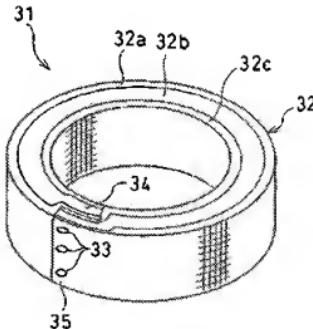
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(54)【考案の名称】 ガス発生器用フィルタ

(57)【要約】

【課題】 本考案は、容器の密着性に優れ、製作が容易で且つコストのフィルタを提供すること。

【解決手段】 2枚のステンレス製の耐熱性のシート状の目の細い金属からなる内層の金属32a, 32cと、同様の材料で形成した目の細かい3枚の金属からなる中間の金属層32bを順次重層して無結することで焼結板32に一体化する。そして、所定長さと幅に切断した後に、両端部34, 35が重なり合う様に筒状に曲げ成形して、重ね合った両端部34, 35を両端から挟んでプレスすることで、その重ね合わせ部の厚み11が他の部分の厚み12と同じになる様に圧縮成形した後に、筒状の外端からスポット溶接33し、フィルタを成形する。



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【実用新案登録請求の範囲】

【請求項1】 エアバッグ用ガス発生器の容器内に配置されるフィルタであって

該フィルタ(31)は、複数の金網を構成して焼結により一体化して得られた焼結板(32)を円筒状に形成して、その端部(34, 35)を重ね合わせ、該重ね合わせ部の厚さが他の部分と同じ厚さになる様にプレスして圧縮し、該圧縮部をスポット溶接(33)により接着してなる焼結フィルタである事で特徴とするガス発生器用フィルタ。

【請求項2】 前記焼結フィルタは、目の粗い金網で形成した強度部材としての内層(32c)及び外層(32a)と、該内外層の間に配置された目の細かい金網で形成した導通部材としての中間層(32b)との3層で構成され、該3層からなる金網の構造体を焼結により一体化した後、該3層からなる金網の構造体を焼結板(32)に接合してなる焼結フィルタである。

【請求項3】 前記焼結フィルタは、目の粗い金網で形成した強度部材としての内層(32c)及び外層(32a)と、該内外層間に位置する導通部材としての中間層(32b)との3層で構成され、該3層からなる構造体を焼結により一体化したものであり、前記中間層(32b)は、金網と金属ファイバーフィルタとを接合して構成されたものである。

【請求項4】 前記内層、中間層及び外層の各層は、それぞれ複数枚の金網を接合して構成され、且つ各金網の目をすらして接合されてなる該請求項2に記載のガス発生器用フィルタ。

【請求項5】 前記フィルタは、前記焼結して得られた焼結板を円筒状に形成し、その端部(34, 35)を重ね合わせて圧縮し、該圧縮部をスポット溶接(33)して得られた円筒状焼結フィルタを所定長さに切断したるものである。

*用フィルタ。

【図面の簡単な説明】

【図1】 本考案のガス発生器用フィルタの斜視図である。

【図2】 本考案で用いる焼結板の断面図である。

【図3】 本考案で用いる焼結板の端部の接合状態を示す概念図であり、(a)は、接合前の状態を示し、(b)は、接合後の状態を示している。

【図4】 本考案で用いる焼結板の金網を示す平面図である。

【図5】 従来のガス発生器用焼結型フィルタの斜視図である。

【図6】 従来のガス発生器用焼結型フィルタの断面図である。

【図7】 ガス発生器の断面図である。

【符号の説明】

1 ガス発生器

11 フィルタ

11a 第1フィルタ

11b 第2フィルタ

21 従来の焼結型フィルタ

31 本考案の焼結型フィルタ

32 焼結板

32a フィルタの外層(金網層)

32b フィルタの中間層(金網層)

32b' フィルタの中間層(ファイバーフィルタ層)

32c フィルタの内層(金網層)

33 スポット溶接

34, 35 端部

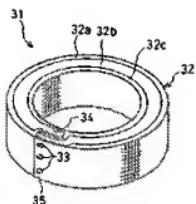
39, 42 層平織金網

41 金網層の斜視図

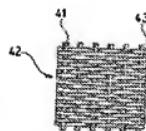
43 金網層の断面図

11, 12 厚み

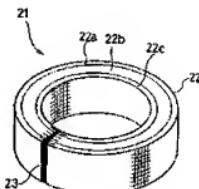
【図1】



【図4】



【図5】

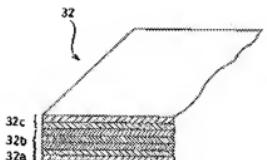


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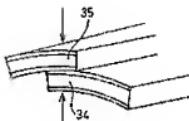
[図2]

(a)

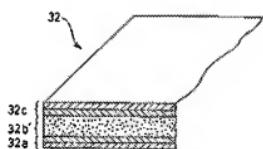


[図3]

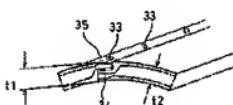
(a)



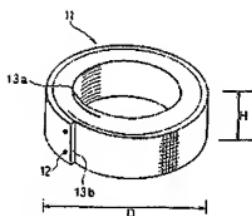
(b)



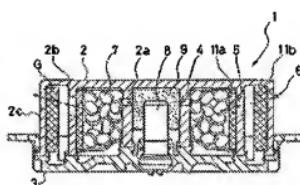
(b)



[図6]



[図7]



フロントページの続き

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【考案の詳細な説明】

【0001】

【考案の属する技術分野】

本考案は、自動車のエアバッグ装置に組み込んで使用されるガス発生器用のフィルタ構造に関するものである。

【0002】

【従来の技術】

エアバッグの展開は、ガス発生器中のガス発生剤が燃焼して生じるガスによって行われるが、このガスは、高温高圧であり且つ燃焼反応によって生じたスラグを含有しているので、このままエアバッグ中に放出すると、高温のスラグ粒子（熱粒子）によるエアバッグの損傷や、乗員に火傷を負わせたり、又、スラグ粒子自体は主として金属化合物であるので、その種類によっては有害物質であり、そのまま放出されると人体に障害を及ぼすおそれがある。そこで、エアバッグの展開用のガスとしては、ガス発生器内で発生した高温高圧のガスを冷却し且つスラグ粒子を除去した清浄なガスでなければならない。このために、ガス発生器内には、冷却とスラグ捕集を兼ねて金属フィルタが配置されている。

【0003】

この様なガス発生器の具体例を図7に示す。図7は運転席側に用いるガス発生器の断面図であり、同図において、ガス発生器1は、円筒状の上容器2と下容器3とを摩擦圧接等で一体化した円筒状の容器であり、内筒2a、中間筒2b及び外筒2cによって半径方向に3室に区画され、前記内筒2a、中間筒2b及び外筒2cにはガス孔4、5、6が穿設されて、各室間及び外部とがこのガス孔によって連通されている。中央室には点火装置8が下方から嵌合され、これに近接して伝火薬9が配置されている。中間室には、ガス発生剤7、第1フィルタ11aが、最外室には第2フィルタ11bが、夫々配置されている。点火装置8は内部に着火薬とヒータとを有し、電源（図示せず）に接続されており、車両が衝突すると、衝突センサ（図示せず）を介して過電圧加熱されて着火薬が点火され、その火炎によって伝火薬9が着火されて燃焼する。伝火薬9からの熱風が、ガス孔4を通って中間室に流入し、ガス発生剤7が燃焼して高温高圧のガスを短時間で大

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量に発生する。このガスは、第1フィルタ11a、第2フィルタ11bを順次通過する事によって冷却とスラグ捕集が行われ、適温の清浄ガスとなって容器のガス孔6からエアバッグ(図示せず)に供給される。

【0004】

係るガス発生器1に使用されるフィルタとしては、図6に示す渦巻きフィルタ11が代表的なものである。このフィルタ11は、金網を単独或いは金網と焼結フィルタ等と一緒に渦巻状の円筒形状に巻きし、終端部をスポット溶接12で固定したものである。

【0005】

又、特開平6-55991号公報に示されている焼結フィルタも使用されている。この焼結フィルタは、図5に示す様に、強度部材としての目の粗い金網からなる外層22a及び内層22cと、その間の渡過部材としての目の細かい金網からなる中間層22bとからなり、この複数の金網を積層して焼結し、得られた焼結フィルタを円筒状に成形し、突合せ溶接してなるものである。

【0006】

【考案が解決しようとする課題】

図6に示した渦巻き状フィルタ11の場合には、伸縮性があり形状が変化し易い金網を張力を掛け乍ら巻き上げて成形するものであるため、寸法精度の管理が非常に困難であり、この結果、高さHの寸法精度がとり難い問題があった。この高さHが、所定値より小さいと、ガス発生器内に組み込んだ場合に、図7に示しているガス発生器の容器とフィルタとの間の隙間Gが大きくなり、この部分からガスが漏出してフィルタ機能が低下する事になる。一方、所定値より大きいと、組み込みが困難となり且つ組み込み時に変形して、ガスの均一な流通を阻害する恐れがある。フィルタ11の直径Dの寸法精度が悪い場合も同様である。更に、渦巻きの始端部と終端部には、段差13a、13bが生じる結果、容器内に配置した際に、該段部が空間部となり、容器との密着性が悪く、上記フィルタ上下部に生じ易い隙間Gの存在と相まって、ガスがスラグ粒子を含んだままフィルタをバイパスして容器外に噴出するおそれがあった。

【0007】

そこで、この問題を解決するものとして、図5の焼結フィルタが提案されている。図5の焼結フィルタ21は、金網等の焼結板を円筒状に成形し、その端部同士を突合せ溶接23によって接合して長尺の円筒体を形成し、これを所定の寸法に切断してフィルタとしているため、前記渦巻き状フィルタの場合に生じる前記隙間Gや前記段部13a, 13bによる空間は生じないので、フィルタは容器に密着し、スラグ粒子の流出を抑える効果は改善されている。しかし乍ら、焼結板の突合せ溶接23には、フィラーワイヤを用いてTIG溶接が行われるため、作業時間が長くなり、フィルタを量産する場合には問題があった。更に、TIG溶接には、フィラーワイヤやシールドガス等の溶材を必要とするため、コストアップにもなり、量産上の問題となっていた。

【0008】

本考案は、上記従来技術の有する問題点に鑑みてなされたものであって、その目的とするところは、容器との密着性に優れ、製作が容易で且つ低コストのフィルタを提供することにある。

【0009】

【課題を解決するための手段】

上記課題を解決するために本考案は、エアバッグ用ガス発生器の容器内に配置されるフィルタであって、複数の金網を積層して焼結により一体化して得られた焼結板を円筒状に形成し、その端部を重ね合わせ、該重ね合わせ部の厚さが他の部分と同じ厚さになる様にプレスして圧縮し、該圧縮部をスポット溶接により接合してなるものである。これにより、焼結フィルタの優位性を生かし且つ溶接工程の短縮化とコストダウンを達成するものである。

【0010】

更に、本考案の焼結フィルタは、目の粗い金網で形成した強度部材としての内層及び外層と、該内外層の間に配置された目の細かい金網で形成した遮過部材としての中間層との3層で構成されているもの、或いは、前記中間層を、金網と金属ファイバーフィルタとを積層して構成したもの等があり、積層焼結フィルタの各層に夫々の機能を持たせたものが好ましい。好ましい金網の材質としては、ステンレススチール、鉄やニッケル等が挙げられる。

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【0011】

更に、前記内層、中間層及び外層の各層を、夫々複数枚の金網を積層して構成し、且つ各金網の目をずらして積層する事により、フィルタの目開きを一層細かくして、フィルタ機能を向上させる事も可能である。

【0012】

又、製作に当たっては、前記焼結して得られた焼結板を円筒状に成形し、その端部を重ね合わせて圧縮し、該圧縮部をスポット溶接して得られた円筒状焼結フィルタを所定長さに切断する様になす事が好ましい。

【0013】

【考案の実施の形態】

以下、本考案の実施例について図面を参照しつつ説明する。図1は、本考案に係るフィルタの斜視図であり、図2は図1の焼結板の断面図、図3は円筒状に成形した焼結板の端部の接合状態を示す概念図である。

【0014】

先ず図1に基づき構造を説明する。図1において、フィルタ31は、3層の金網層32a、32b、32cが焼結により一体化された焼結板32を、円筒状に成形し、その両端部34、35を重ね合わせて圧縮し、スポット溶接33によって接合されている。金網層の構成は、図2(a)に示している様に、外層の金網層32a及び内層の金網層32cは、比較的目の粗い2枚の金網からなり、中間層の金網層32bは、比較的目の細かい3枚の金網からなっている。外層及び内層の目を粗くするのは、フィルタの機械的強度を向上させるためであり、中間層の目を細かくするのは、滤過性能を向上させるためである。又、各層の金網を複数枚としているのは、フィルタ全体の強度を高めるためと、金網の目の位置をずらすことによって滤過性能を向上させるためである。この様に、金網の目の粗さを適宜選択して組み合わせることにより、所望の機械的強度と滤過性能を併せ持つフィルタが得られる。

【0015】

又、図2(b)に示した様に、中間層を、金網層32bに代えて、金属ファイバーフィルタ32b'で構成することもできる。この様に金属ファイバーフィル

クを用いると、外層32aと内層32cの金網の機械的強度と、中间層32b'の金属ファイバーフィルタの特長である透過性能を併せ持つフィルタを得る事ができる。好ましい金属ファイバーの材質としては、ステンレススチール、鉄やニッケル等が挙げられる。

【0016】

次に、上記フィルタの製作工程について説明すると、図2において、前述した様に、夫々2枚のステンレス製の耐熱性のシート状の目の粗い金網からなる内外層の金網層32a、32cと、同様の材料で形成した目の細かい3枚の金網からなる中间層の金網層32b'を順次積層し、この金網積層体を、焼結炉で約1000℃に加熱しながら軟化状態でプレスして焼結一体化する。金網は、通常の平織又は疊平織或いはメリヤス編みのものが適宜用いられる。高温下でプレスすると、主として線が絡み合い或いは冶金的に結合する事によって機械的な結合力を生じ、全体が一体化する。この一体化された焼結板32を、所定の長さと幅に切断後、図3(a)に示す様に、両端部34、35が重なり合う様に円筒形状に曲げ成形した後、該重ね合わせ部を両側から挟んで矢印の方向にプレスし、同図(b)に示す様に、その重ね合わせ部の厚みt1が、他の部分の厚みt2と同じになる様に圧縮してスポット溶接33を行い、前記端部の圧縮部を接合する事によりフィルタが得られる。

【0017】

或いは、前記焼結板32を所定の幅と長さに切断する事なく、先に円筒状に成形してスポット溶接により接合した後、所定の幅に切断してフィルタとなす事も可能である。シート状の焼結板32は、一体化により定型性を賦与されるので、精度よく切断する事ができる。従って、得られたフィルタの寸法精度も高く、ガス発生器の容器内に接着しても、従来の漏巻きフィルタの様な隙間Gが発生する事はない。

【0018】

次に、中间層を金網層32b'に代えて金属ファイバーフィルタ層32b'とした複合フィルタの場合について説明する。図2(b)において、焼結前の金属ファイバーフィルタ層32b'は、線径10ミクロン程度のステンレスファイバー

をクッション状に積層してしてなり、この複合フィルタ32は、上述の金網のみの場合と同様に、焼結炉で約1000℃に加熱して軟化状態でプレスして焼結一体化されて焼結板とされる。その後は金網のみの場合と同様である。この様に、金属ファイバーと金網とを組み合わせて前記焼結体を構成すると、金網の特長である強度と目の細かいファイバーフィルタの特長である滤過性能を併せ持つフィルタを得ることができる。

【0019】

尚、上述の要領で成形したフィルタの上面或いは下面をグラインダ等で接り削ると、焼結体の金網の線のバリによって表面近傍の目が埋め尽くされてガスが通過できなくなるので、ガスがフィルタ上下端面から漏洩してフィルタ効率が低下する事が防止される。

【0020】

更に、円筒状フィルタは、内圧により円周方向に引張力が働くので、軸方向より円周方向の強度が要求される。そこで、図4に示す様に、疊平織の金網42を用いる方法がある。即ち、疊平織の金網42は、太い金属線で構成され所定間隔で配置された縦線材41と、細い金属線で構成され密に配置された横線材43とで図示の如く構成したもので、横線材の方が線が密に配列されているため、横線材の方が、縦線材に比べて大きな断面積と、その断面積に比例した抗張力を有している。そこで、横線材の細い金属線を円周方向にして金網層を形成することにより、その強度を最大限に発揮させて、ガス発生時の内圧により円周方向に作用する大きな引張力に抗する事が容易となる。一方、このようにすると、製造工程において金網を所定幅に切断する際に、密に配列された細い金属線に沿って金網を切断することになり、最外線がほつれて外れる等の弊害が予想されるが、金網が金属ファイバーフィルタ或いは積層された他の金網と一体的に焼結されているので、切断時のほつれ等が防止でき、切断が容易になる。尚、この疊平織の金網は、フィルタの内層或いは外層に使用するのが好ましい。

【0021】

【考案の効果】

本考案のガス発生器用フィルタは、上述のように、金網を複数枚重ねて焼結に

(10)

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より一体化した焼結板を円筒状に成形し、その端部を重ね合わせてプレスにより重ね合わせ部の厚さが他の部分の厚さとほぼ同一になる様に圧縮し、その状態でスポット溶接により接合しているので、円筒状フィルタの内外面は、ほぼ真円になり、従来の渦巻型フィルタの如き、端部に段部が形成されないので、外段部の空間を通過してガスが外部に漏洩することがなくなり、フィルタの通過効率及びガス冷却効果が一層向上する。

【0022】

又、焼結体の端部を、スポット溶接で接合する様にしているので、従来の焼結フィルタの端面の突合せ溶接に比べて、溶材を必要とせず且つ短時間で接合可能となり、製作コストの削減と製作時間の短縮化が可能となって、量産化が容易となる。

【0023】

更に、焼結フィルタを用いる事により、渦巻型フィルタに比べて切断等の加工精度が向上し、この結果、ガス発生器の容器とフィルタとの隙間のバラツキが小さくなり、ガス発生器の性能を安定させることができる。

【0024】

円筒状フィルタの外形がほぼ真円となり、ガス発生器の容器内面に密着するので、アッズスペースがなくなり、この結果、ガス発生器の寸法を小さく形成する事が可能となり、ガス発生器の小型化、軽量化に寄与する事になる。

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DETAILED DESCRIPTION

[Detailed explanation of the device]

[0001]

[The technical field to which a device belongs]

This design is related with the filter structure for gas generators used including in the air bag device of a car.

[0002]

[Description of the Prior Art]

Although deployment of an air bag is performed by the gas which the generation-of-gas agent in a gas generator burns and produces, Since this gas contains the slag which is high temperature high pressure and was produced by the combustion reaction, Since a burn is inflicted on damage to the air bag by a hot slag grain child (heat particles), and a crew member and the slag grain child itself is mainly a metallic oxide when it emits into an air bag as it is, depending on that kind, it is a toxic substance.

When then emitted, there is a possibility of doing an obstacle to a human body.

Then, it must be the pure gas which cooled the gas of high temperature high pressure emitted within the gas generator as gas for deployment of an air bag, and removed the slag grain child. For this reason, in the gas generator, the metal filter is arranged to serve both as cooling and a slug collection.

[0003]

The example of such a gas generator is shown in drawing 7. Drawing 7 is a sectional view of the gas generator used for a drivers side, and the gas generator 1 is a cylindrical container which unified the cylindrical upper case 2 and the lower container 3 by friction welding etc. in the figure.

It is radially divided by three rooms with the container liner 2a, intermediate cylinder 2b, and the outer case 2c, the gas eyes 4, 5, and 6 are drilled by said container liner 2a, intermediate

cylinder 2b, and the outer case 2c, and between each ** and the exterior are opened for free passage by this gas eye.

The ignition 8 is fitted in a center chamber from a lower part, this is approached, and the transfer charge 9 is arranged. In an intermediate room, the generation-of-gas agent 7 and the 1st filter 11a are arranged, and the 2nd filter 11b is arranged at the maximum outer chamber, respectively. If it has ignition medicine and a heater inside, and is connected to the power supply (not shown) and vehicles collide, energizing heating is carried out via a collision sensor (not shown), ignition medicine is lit, with the flame, the transfer charge 9 will be lit and the ignition 8 will burn. The hot wind from the transfer charge 9 flows into an intermediate room through the gas eye 4, the generation-of-gas agent 7 burns, and the gas of high temperature high pressure is generated in large quantities for a short time. By passing the 1st filter 11a and the 2nd filter 11b one by one, cooling and a slug collection are performed, and this gas turns into cleaned gas of optimal temperature, and is supplied to an air bag (not shown) from the gas eye 6 of a container.

[0004]

As a filter used for the gas generator 1 to apply, the whorl filter 11 shown in drawing 6 is typical. This filter 11 fixes independent or a wire gauze, a sintered filter, etc. by winding, and fixes a trailer to cylindrical shape spiral together for a wire gauze by the spot welding 12.

[0005]

The sintered filter shown in JP,6-55991,A is also used. The outer layer 22a and the inner layer 22c which consist of a wire gauze with a coarse eye as a reinforcement member as this sintered filter is shown in drawing 5, It consists of the interlayer 22b who consists of a wire gauze with a fine eye as a filter member in the meantime, and the sintered filter obtained by laminating and sintering two or more of these wire gauzes is fabricated cylindrical, and butt welding is carried out.

[0006]

[Problem(s) to be Solved by the Device]

Since elasticity was what hangs and carries out ** winding-up ***** of the wire gauze the shape of whose a dovetail shape changes easily for tension, in the case of the spiral filter 11 shown in drawing 6, management of dimensional accuracy is dramatically difficult, and, as a result, there was a problem which dimensional accuracy of height H cannot take easily in it. When this height H was smaller than the predetermined value and it incorporates in a gas generator, the crevice G between the container of a gas generator and filter which are shown in drawing 7 becomes large, gas will leak out from this portion, and a filtering function will fall. On the other hand, when larger than a predetermined value, inclusion becomes difficult, and it changes at the time of inclusion, and there is a possibility of checking uniform circulation of gas. It is also the same as when the dimensional accuracy of the diameter D of the filter 11 is

bad. The result which the level differences 13a and 13b produce in a vertical leader and trailer, When it had arranged in a container, there was a possibility of this step turning into a space part, bypassing a filter while gas had contained the slag grain child conjointly with existence of the crevice G which adhesion with a container is bad and tends to produce in the above-mentioned filter vertical section, and spouting besides a container.

[0007]

Then, the sintered filter of drawing 5 is proposed as what solves this problem. Since the sintered filter 21 of drawing 5 fabricates sintering plates, such as a wire gauze, cylindrical, joins the ends by the butt welding 23, forms a long cylinder body, cuts this in a predetermined size and makes it the filter, Since said crevice G which is produced in the case of said spiral filter, and the space by said steps 13a and 13b are not produced, a filter is stuck to a container and the effect of suppressing a slag grain child's outflow improves. However, since TIG arc welding was performed using a filler wire, when working hours became long and mass-produced a filter, there was a problem in the butt welding 23 of ** et al. and a sintering plate. Since hot charge, such as a filler wire and shielding gas, was needed, it also became a cost hike and had become a problem of mass production at TIG arc welding.

[0008]

It excels in adhesion with a container, and the place which this design is made in view of the problem which the above-mentioned conventional technology has, and is made into the purpose is easy to manufacture, and there is in providing the filter of low cost.

[0009]

[Means for Solving the Problem]

In order to solve an aforementioned problem, this design is a filter arranged in a container of a gas generator for air bags, Two or more wire gauzes are laminated, a sintering plate produced by unifying by sintering is formed cylindrical, and the end is piled up, it presses and compresses so that thickness of this superposition part turns into the same thickness as other portions, and this compression zone is joined by spot welding. Thereby, the predominance of a sintered filter is employed efficiently and shortening and a cost cut of a welding process are attained.

[0010]

A inner layer and an outer layer as a reinforcement member which formed a sintered filter of this design at a wire gauze with coarse eyes, What there are some etc. which laminated a wire gauze and a metallic-fibers filter and constituted a thing which comprises three layers with an interlayer as a filter member formed at a wire gauze with a fine eye arranged between these inside-and-outside layers, or said interlayer, and gave each class of a lamination sintered filter each function is preferred. A stainless steel, iron, nickel, etc. are mentioned as construction material of a desirable wire gauze.

[0011]

It is also possible to laminate two or more wire gauzes, respectively, and to constitute each class of said inner layer, an interlayer, and an outer layer, and to make an opening of a filter still finer by shifting and laminating an eye of each wire gauze, and to raise a filtering function.

[0012]

It is preferred to make as [cut / to predetermined length / a cylindrical sintered filter produced by fabricating said sintering plate produced by sintering cylindrical, piling up and compressing the end in manufacture, and carrying out spot welding of this compression zone].

[0013]

[An embodiment of a device]

Hereafter, it explains, referring to drawings for an example of this design. Drawing 1 is a perspective view of a filter concerning this design, and drawing 2 is a sectional view of a sintering plate of drawing 1, and a key map showing a jointing condition of an end of a sintering plate which fabricated drawing 3 cylindrical.

[0014]

Based on drawing 1, structure is explained first. In drawing 1, the three-layer wire gauze layers 32a, 32b, and 32c fabricate the sintering plate 32 unified by sintering cylindrical, and pile up and compress the both ends 34 and 35, and the filter 31 is joined by the spot welding 33. The wire gauze layer 32a of an outer layer and the wire gauze layer 32c of a inner layer consist of two wire gauzes with comparatively coarse eyes, and an interlayer's wire gauze layer 32b consists of three comparatively fine-tooth wire gauzes as composition of a wire gauze layer is shown in drawing 2 (a). An eye of an outer layer and a inner layer is made coarse in order to raise a mechanical strength of a filter, and an interlayer's eyes are made fine in order to raise a filtration efficiency. It is considered as two or more wire gauzes of each class in order to raise a filtration efficiency by shifting a position of an eye of a wire gauze in order to raise intensity of the whole filter. Thus, a filter having a desired mechanical strength and a filtration efficiency is obtained by choosing granularity of an eye of a wire gauze suitably and combining it.

[0015]

As shown in drawing 2 (b), an interlayer can be replaced with the wire gauze layer 32b, and can also consist of metallic-fibers filter 32b'. Thus, if a metallic-fibers filter is used, a filter having a filtration efficiency which are a mechanical strength of a wire gauze of the outer layer 32a and the inner layer 32c and the feature of a metallic-fibers filter of interlayer 32b' can be obtained. A stainless steel, iron, nickel, etc. are mentioned as construction material of desirable metallic fibers.

[0016]

Next, in [a manufacturing process of the above-mentioned filter is explained] drawing 2, The wire gauze layers 32a and 32c of an inside-and-outside layer which consists of two wire

gauzes with a sheet shaped heat-resistant coarse eye made from stainless steel, respectively as mentioned above, The wire gauze layer 32b of an interlayer who consists of three wire gauzes with a fine eye formed with same material is laminated one by one, and sintering unification is pressed and carried out by a softened state, heating this wire gauze layered product at about 1000 ** with a sintering furnace. As for a wire gauze, a thing of the usual plain weave, a tatami plain weave, or stockinet is used suitably. If pressed under an elevated temperature, by a line's mainly becoming entangled or joining together in metallurgy, mechanical associative strength will be produced and the whole will unify. As this unified sintering plate 32 is shown in drawing 3 (a) after cutting to predetermined length and width, After bending and fabricating to cylindrical shape so that the both ends 34 and 35 may overlap, on both sides of this superposition part, it presses in the direction of an arrow from both sides, As shown in the figure (b), it compresses so that the thickness t1 of the superposition part becomes the same as the thickness t2 of other portions, and spot welding 33 is performed, and a filter is obtained by joining a compression zone of said end.

[0017]

Or after fabricating cylindrical previously and joining by spot welding, without cutting said sintering plate 32 to predetermined width and length, it is also possible to cut to predetermined width and to make with a filter. Since fixed form nature is granted by unification, the sheet shaped sintering plate 32 can be cut with sufficient accuracy. Therefore, even if dimensional accuracy of an obtained filter is also high and it equips with it in a container of a gas generator, the crevice G like the conventional whorl filter does not occur.

[0018]

Next, a case of a compound filter which replaced an interlayer with the wire gauze layer 32b, and was made into metallic-fibers filter layer 32b' is explained. In drawing 2 (b), metallic-fibers filter layer 32b' before sintering, A stainless steel fiber of about 10 microns of wire sizes is laminated in the shape of a cushion, and is carried out, and like a case of only an above-mentioned wire gauze, it heats at about 1000 ** with a sintering furnace, and sintering unification is pressed and carried out by a softened state, and let this compound filter 32 be a sintering plate. It is the same as that of a case of only a wire gauze after that. Thus, if said sintered compact is constituted combining metallic fibers and a wire gauze, a filter having intensity which is the feature of a wire gauze, and a filtration efficiency which is the features of a fine-tooth fiber filter can be obtained.

[0019]

Since an eye near the surface is filled by barricade of a line of a wire gauze of a sintered compact and it becomes impossible to pass gas in it when the upper surface or the undersurface of a filter fabricated in an above-mentioned way is ground against a grinder etc. and crushed, filter efficiency is prevented from gas being revealed from a filter upper-and-

lower-ends side, and falling.

[0020]

Since tensile force commits a cylindrical filter to a circumferencial direction with internal pressure, intensity of a circumferencial direction is required from shaft orientations. Then, as shown in drawing 4, there is a method of using the wire gauze 42 of a tatami plain weave. Namely, the wire gauze 42 of a tatami plain weave is what was woven like a graphic display by the vertical bar material 41 which comprised a thick metal wire and has been arranged with a prescribed interval, and the horizontal line material 43 which comprised a thin metal wire and has been arranged densely. Since a line is arranged densely, a direction of horizontal line material has the tensile strength to which a direction of horizontal line material is proportional to a big cross-section area and its cross-section area compared with vertical bar material. Then, by making a thin metal wire of horizontal line material into a circumferencial direction, and forming a wire gauze layer, the intensity is demonstrated to the maximum extent, and it becomes easy to resist big tensile force which acts on a circumferencial direction with internal pressure at the time of the generation of gas. On the other hand, if it does in this way, when cutting a wire gauze to prescribed width in a manufacturing process, a wire gauze will be cut along a thin metal wire arranged densely, and evils, like the outermost line frays and separates will be expected, but. Since a wire gauze is sintered in one with a metallic-fibers filter or other wire gauzes which were laminated, a fray at the time of cutting, etc. can be prevented and cutting becomes easy. As for a wire gauze of this tatami plain weave, it is preferred to use it for a inner layer or an outer layer of a filter.

[0021]

[Effect of the Device]

The filter for gas generators of this design fabricates the sintering plate which piled up two or more wire gauzes and was unified by sintering as mentioned above cylindrical. Since it compressed so that you piled up the end, you made it pile each other up with a press and the thickness of a part became almost the same as that of the thickness of other portions, and it has joined by spot welding in the state. Since it becomes a perfect circle mostly and a step is not formed in an end [like / the conventional swirl type filter], it is lost that pass through the space of an outside step and gas is revealed outside of the internal and external surfaces of a cylindrical filter, and its filtration efficiency and gas-cooling-method effect of a filter improve further.

[0022]

Since he is trying to join the end of a sintered compact by spot welding, compared with butt welding of the end face of the conventional sintered filter, hot charge is not needed, and it becomes joinable for a short time, reduction of a manufacturing cost and shortening of manufacture time are attained, and fertilization becomes easy.

[0023]

By using a sintered filter, process tolerance, such as cutting, can improve compared with a swirl type filter, as a result, the variation in the crevice between the container of a gas generator and a filter can become small, and the performance of a gas generator can be stabilized.

[0024]

Since the outside of a cylindrical filter serves as a perfect circle mostly and it sticks to the container internal surface of a gas generator, it becomes possible to lose a dead space and to form the size of a gas generator small as a result, and will contribute to the miniaturization of a gas generator, and a weight saving.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Device]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Device]

Since elasticity was what hangs and carries out ** winding-up ***** of the wire gauze the shape of whose a dovetail shape changes easily for tension, in the case of the spiral filter 11 shown in drawing 6, management of dimensional accuracy is dramatically difficult, and, as a result, there was a problem which dimensional accuracy of height H cannot take easily in it. When this height H was smaller than the predetermined value and it incorporates in a gas generator, the crevice G between the container of a gas generator and filter which are shown in drawing 7 becomes large, gas will leak out from this portion, and a filtering function will fall. On the other hand, when larger than a predetermined value, inclusion becomes difficult, and it changes at the time of inclusion, and there is a possibility of checking uniform circulation of gas. It is also the same as when the dimensional accuracy of the diameter D of the filter 11 is bad. The result which the level differences 13a and 13b produce in a vortical leader and trailer, When it had arranged in a container, there was a possibility of this step turning into a space part, bypassing a filter while gas had contained the slag grain child conjointly with existence of the crevice G which adhesion with a container is bad and tends to produce in the above-mentioned filter vertical section, and spouting besides a container.

[0007]

Then, the sintered filter of drawing 5 is proposed as what solves this problem. Since the sintered filter 21 of drawing 5 fabricates sintering plates, such as a wire gauze, cylindrical, joins the ends by the butt welding 23, forms a long cylinder body, cuts this in a predetermined size and makes it the filter, Since said crevice G which is produced in the case of said spiral filter, and the space by said steps 13a and 13b are not produced, a filter is stuck to a container and the effect of suppressing a slag grain child's outflow improves. However, since TIG arc welding was performed using a filler wire, when working hours became long and mass-produced a filter, there was a problem in the butt welding 23 of ** et al. and a sintering plate. Since hot

charge, such as a filler wire and shielding gas, was needed, it also became a cost hike and had become a problem of mass production at TIG arc welding.

[0008]

It excels in adhesion with a container, and the place which this design is made in view of the problem which the above-mentioned conventional technology has, and is made into the purpose is easy to manufacture, and there is in providing the filter of low cost.

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MEANS

[Means for Solving the Problem]

In order to solve an aforementioned problem, this design is a filter arranged in a container of a gas generator for air bags. Two or more wire gauzes are laminated, a sintering plate produced by unifying by sintering is formed cylindrical, and the end is piled up, it presses and compresses so that thickness of this superposition part turns into the same thickness as other portions, and this compression zone is joined by spot welding. Thereby, the predominance of a sintered filter is employed efficiently and shortening and a cost cut of a welding process are attained.

[0010]

A inner layer and an outer layer as a reinforcement member which formed a sintered filter of this design at a wire gauze with coarse eyes, What there are some etc. which laminated a wire gauze and a metallic-fibers filter and constituted a thing which comprises three layers with an interlayer as a filter member formed at a wire gauze with a fine eye arranged between these inside-and-outside layers, or said interlayer, and gave each class of a lamination sintered filter each function is preferred. A stainless steel, iron, nickel, etc. are mentioned as construction material of a desirable wire gauze.

[0011]

It is also possible to laminate two or more wire gauzes, respectively, and to constitute each class of said inner layer, an interlayer, and an outer layer, and to make an opening of a filter still finer by shifting and laminating an eye of each wire gauze, and to raise a filtering function.

[0012]

It is preferred to make as [cut / to predetermined length / a cylindrical sintered filter produced by fabricating said sintering plate produced by sintering cylindrical, piling up and compressing the end in manufacture, and carrying out spot welding of this compression zone].

[0013]

[An embodiment of a device]

Hereafter, it explains, referring to drawings for an example of this design. Drawing 1 is a perspective view of a filter concerning this design, and drawing 2 is a sectional view of a sintering plate of drawing 1, and a key map showing a jointing condition of an end of a sintering plate which fabricated drawing 3 cylindrical.

[0014]

Based on drawing 1, structure is explained first. In drawing 1, the three-layer wire gauze layers 32a, 32b, and 32c fabricate the sintering plate 32 unified by sintering cylindrical, and pile up and compress the both ends 34 and 35, and the filter 31 is joined by the spot welding 33. The wire gauze layer 32a of an outer layer and the wire gauze layer 32c of an inner layer consist of two wire gauzes with comparatively coarse eyes, and an interlayer's wire gauze layer 32b consists of three comparatively fine-tooth wire gauzes as composition of a wire gauze layer is shown in drawing 2 (a). An eye of an outer layer and an inner layer is made coarse in order to raise a mechanical strength of a filter, and an interlayer's eyes are made fine in order to raise a filtration efficiency. It is considered as two or more wire gauzes of each class in order to raise a filtration efficiency by shifting a position of an eye of a wire gauze in order to raise intensity of the whole filter. Thus, a filter having a desired mechanical strength and a filtration efficiency is obtained by choosing granularity of an eye of a wire gauze suitably and combining it.

[0015]

As shown in drawing 2 (b), an interlayer can be replaced with the wire gauze layer 32b, and can also consist of metallic-fibers filter 32b'. Thus, if a metallic-fibers filter is used, a filter having a filtration efficiency which are a mechanical strength of a wire gauze of the outer layer 32a and the inner layer 32c and the feature of a metallic-fibers filter of interlayer 32b' can be obtained. A stainless steel, iron, nickel, etc. are mentioned as construction material of desirable metallic fibers.

[0016]

Next, in [if a manufacturing process of the above-mentioned filter is explained] drawing 2, The wire gauze layers 32a and 32c of an inside-and-outside layer which consists of two wire gauzes with a sheet shaped heat-resistant coarse eye made from stainless steel, respectively as mentioned above, The wire gauze layer 32b of an interlayer who consists of three wire gauzes with a fine eye formed with same material is laminated one by one, and sintering unification is pressed and carried out by a softened state, heating this wire gauze layered product at about 1000 ** with a sintering furnace. As for a wire gauze, a thing of the usual plain weave, a tatami plain weave, or stockinet is used suitably. If pressed under an elevated temperature, by a line's mainly becoming entangled or joining together in metallurgy, mechanical associative strength will be produced and the whole will unify. As this unified sintering plate 32 is shown in drawing 3 (a) after cutting to predetermined length and width,

After bending and fabricating to cylindrical shape so that the both ends 34 and 35 may overlap, on both sides of this superposition part, it presses in the direction of an arrow from both sides, As shown in the figure (b), it compresses so that the thickness t1 of the superposition part becomes the same as the thickness t2 of other portions, and spot welding 33 is performed, and a filter is obtained by joining a compression zone of said end.

[0017]

Or after fabricating cylindrical previously and joining by spot welding, without cutting said sintering plate 32 to predetermined width and length, it is also possible to cut to predetermined width and to make with a filter. Since fixed form nature is granted by unification, the sheet shaped sintering plate 32 can be cut with sufficient accuracy. Therefore, even if dimensional accuracy of an obtained filter is also high and it equips with it in a container of a gas generator, the crevice G like the conventional whorl filter does not occur.

[0018]

Next, a case of a compound filter which replaced an interlayer with the wire gauze layer 32b, and was made into metallic-fibers filter layer 32b' is explained. In drawing 2 (b), metallic-fibers filter layer 32b' before sintering, A stainless steel fiber of about 10 microns of wire sizes is laminated in the shape of a cushion, and is carried out, and like a case of only an above-mentioned wire gauze, it heats at about 1000 ** with a sintering furnace, and sintering unification is pressed and carried out by a softened state, and let this compound filter 32 be a sintering plate. It is the same as that of a case of only a wire gauze after that. Thus, if said sintered compact is constituted combining metallic fibers and a wire gauze, a filter having intensity which is the feature of a wire gauze, and a filtration efficiency which is the features of a fine-tooth fiber filter can be obtained.

[0019]

Since an eye near the surface is filled by barricade of a line of a wire gauze of a sintered compact and it becomes impossible to pass gas in it when the upper surface or the undersurface of a filter fabricated in an above-mentioned way is ground against a grinder etc. and crushed, filter efficiency is prevented from gas being revealed from a filter upper-and-lower-ends side, and falling.

[0020]

Since tensile force commits a cylindrical filter to a circumferencial direction with internal pressure, intensity of a circumferencial direction is required from shaft orientations. Then, as shown in drawing 4, there is a method of using the wire gauze 42 of a tatami plain weave. Namely, the wire gauze 42 of a tatami plain weave is what was woven like a graphic display by the vertical bar material 41 which comprised a thick metal wire and has been arranged with a prescribed interval, and the horizontal line material 43 which comprised a thin metal wire and has been arranged densely, Since a line is arranged densely, a direction of horizontal line

material has the tensile strength to which a direction of horizontal line material is proportional to a big cross-section area and its cross-section area compared with vertical bar material. Then, by making a thin metal wire of horizontal line material into a circumferencial direction, and forming a wire gauze layer, the intensity is demonstrated to the maximum extent, and it becomes easy to resist big tensile force which acts on a circumferencial direction with internal pressure at the time of the generation of gas. On the other hand, if it does in this way, when cutting a wire gauze to prescribed width in a manufacturing process, a wire gauze will be cut along a thin metal wire arranged densely, and evils, like the outermost line frays and separates will be expected, but. Since a wire gauze is sintered in one with a metallic-fibers filter or other wire gauzes which were laminated, a fray at the time of cutting, etc. can be prevented and cutting becomes easy. As for a wire gauze of this tatami plain weave, it is preferred to use it for a inner layer or an outer layer of a filter.

[0021]

[Translation done.]

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PRIOR ART

[Description of the Prior Art]

Although deployment of an air bag is performed by the gas which the generation-of-gas agent in a gas generator burns and produces, Since this gas contains the slag which is high temperature high pressure and was produced by the combustion reaction, Since a burn is inflicted on damage to the air bag by a hot slag grain child (heat particles), and a crew member and the slag grain child itself is mainly a metallic oxide when it emits into an air bag as it is, depending on that kind, it is a toxic substance.

When then emitted, there is a possibility of doing an obstacle to a human body.

Then, it must be the pure gas which cooled the gas of high temperature high pressure emitted within the gas generator as gas for deployment of an air bag, and removed the slag grain child. For this reason, in the gas generator, the metal filter is arranged to serve both as cooling and a slug collection.

[0003]

The example of such a gas generator is shown in drawing 7. Drawing 7 is a sectional view of the gas generator used for a drivers side, and the gas generator 1 is a cylindrical container which unified the cylindrical upper case 2 and the lower container 3 by friction welding etc. in the figure.

It is radially divided by three rooms with the container liner 2a, intermediate cylinder 2b, and the outer case 2c, the gas eyes 4, 5, and 6 are drilled by said container liner 2a, intermediate cylinder 2b, and the outer case 2c, and between each ** and the exterior are opened for free passage by this gas eye.

The ignition 8 is fitted in a center chamber from a lower part, this is approached, and the transfer charge 9 is arranged. In an intermediate room, the generation-of-gas agent 7 and the 1st filter 11a are arranged, and the 2nd filter 11b is arranged at the maximum outer chamber, respectively. If it has ignition medicine and a heater inside, and is connected to the power

supply (not shown) and vehicles collide, energizing heating is carried out via a collision sensor (not shown), ignition medicine is lit, with the flame, the transfer charge 9 will be lit and the ignition 8 will burn. The hot wind from the transfer charge 9 flows into an intermediate room through the gas eye 4, the generation-of-gas agent 7 burns, and the gas of high temperature high pressure is generated in large quantities for a short time. By passing the 1st filter 11a and the 2nd filter 11b one by one, cooling and a slug collection are performed, and this gas turns into cleaned gas of optimal temperature, and is supplied to an air bag (not shown) from the gas eye 6 of a container.

[0004]

As a filter used for the gas generator 1 to apply, the whorl filter 11 shown in drawing 6 is typical. This filter 11 fixes independent or a wire gauze, a sintered filter, etc. by winding, and fixes a trailer to cylindrical shape spiral together for a wire gauze by the spot welding 12.

[0005]

The sintered filter shown in JP,6-55991,A is also used. The outer layer 22a and the inner layer 22c which consist of a wire gauze with a coarse eye as a reinforcement member as this sintered filter is shown in drawing 5, It consists of the interlayer 22b who consists of a wire gauze with a fine eye as a filter member in the meantime, and the sintered filter obtained by laminating and sintering two or more of these wire gauzes is fabricated cylindrical, and butt welding is carried out.

[0006]

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a perspective view of the filter for gas generators of this design.

[Drawing 2]It is a sectional view of the sintering plate used about this design.

[Drawing 3]It is a key map showing the jointing condition of the end of the sintering plate used about this design, and (a) shows the state before junction and (b) shows the state after junction.

[Drawing 4]It is a top view showing the wire gauze of the tatami plain weave used about this design.

[Drawing 5]It is a perspective view of the conventional sintering mold filter for gas generators.

[Drawing 6]It is a perspective view of the conventional swirl type filter for gas generators.

[Drawing 7]It is a sectional view of a gas generator.

[Description of Notations]

1 Gas generator

11 Filter

11a The 1st filter

11b The 2nd filter

21 The conventional sintering mold filter

31 The sintering mold filter of this design

32 Sintering plate

32a The outer layer of a filter (wire gauze layer)

32b The interlayer of a filter (wire gauze layer)

interlayer (fiber filter layer) of a 32b' filter

32c The inner layer of a filter (wire gauze layer)

33 Spot welding

34 and 35 End

42 Tatami plain weave wire gauze

41 Vertical bar material of a tatami plain weave wire gauze

43 Horizontal line material of a tatami plain weave wire gauze

t1, t2 thickness

[Translation done.]

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CLAIMS

[The scope of a claim for utility model registration]

[Claim 1]Are a filter arranged in a container of a gas generator for air bags, and this filter (31), Laminate two or more wire gauzes and a sintering plate (32) produced by unifying by sintering is formed cylindrical, A filter for gas generators being a sintered filter which piles up the end (34, 35), presses and compresses so that thickness of this superposition part turns into the same thickness as other portions, and joins this compression zone by spot welding (33).

[Claim 2]A inner layer (32c) and an outer layer (32a) as a reinforcement member which formed said sintered filter at a wire gauze with coarse eyes, The filter for gas generators according to claim 1 which comprises three layers with an interlayer (32b) as a filter member formed at a wire gauze with a fine eye arranged between these inside-and-outside layers, and unifies a layered product of this wire gauze that consists of 3 layer by sintering.

[Claim 3]A inner layer (32c) and an outer layer (32a) as a reinforcement member which formed said sintered filter at a wire gauze with coarse eyes, Comprise three layers with an interlayer (32b') as a filter member located between these inside-and-outside layers, unify by sintering, and this layered product that consists of 3 layer said interlayer (32b'), The filter for gas generators according to claim 1 constituted by laminating a wire gauze and a metallic-fibers filter.

[Claim 4]The filter for gas generators according to claim 2 which it comes to laminate by each class of said inner layer, an interlayer, and an outer layer laminating two or more wire gauzes, respectively, and constituting it, and shifting an eye of each wire gauze.

[Claim 5]The filter for gas generators according to any one of claims 1 to 4 from which a cylindrical sintered filter produced by spot welding (33) Said filter's fabricating said sintering plate produced by sintering cylindrical, piling up and compressing the end (34, 35), and carrying out this compression zone is cut to predetermined length.

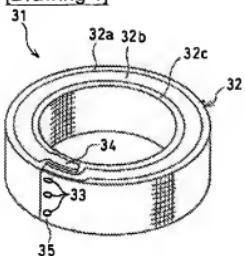
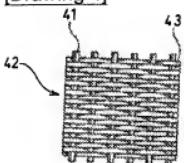
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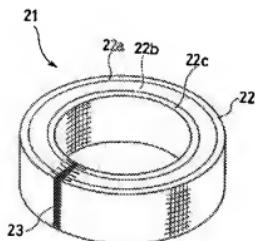
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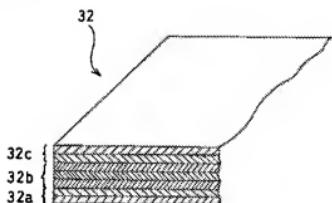
DRAWINGS

[Drawing 1]**[Drawing 4]****[Drawing 5]**

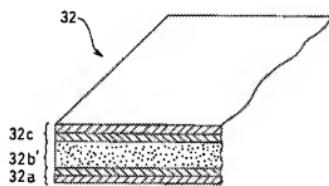


[Drawing 2]

(a)

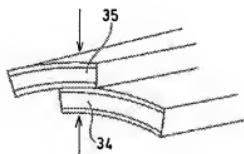


(b)

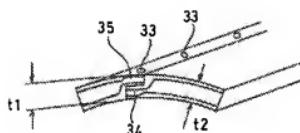
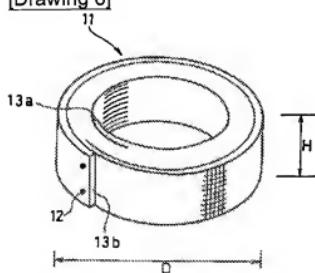
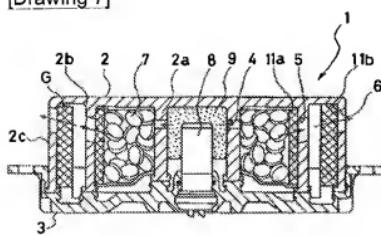


[Drawing 3]

(a)



(b)

[Drawing 6][Drawing 7]

[Translation done.]